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ABSTRACT

Noting that attention, or increased mental effort, has long been recognized as an important variable in the processing of mass communication messages, this paper examines both methodological and theoretical issues associated with the measurement of attention, particularly to the news and public affairs content in the news media. After a brief review of a number of methods of assessing attention in media research, the paper explores in detail an array of survey measures used in a panel study of the media use and level of knowledge of political and current public affairs issues of adolescents and their parents. Methodological issues addressed in this exploration include the empirical utility of several different ways of asking survey questions about attention, while theoretical issues concern comparisons between use of newspapers and television and researchers' neglect of attention that has led to an underestimation of the importance of television news as a contributor to the public's political knowledge. The paper concludes that the measures discussed are more notable for their utility and general validity than for their reliability or precision, and that attention to news media appears to be a consistent individual difference that accounts for substantial variation in learning beyond the act of simple exposure. (FL)

MEASUREMENT AND EFFECTS OF ATTENTION TO MEDIA NEWS

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MEASUREMENT AND EFFECTS OF ATTENTION TO MEDIA NEWS

Attention, or increased mental effort, has long been recognized as an important variable in the processing of mass communication messages. Necessary conditions such as exposure and perception might be thought of theoretically as dichotomous "on-off" states, but behaviorally they vary according to the intensity of attentiveness associated with them. While there is little formal theory specific to media attention, pragmatic principles of applied mass communication (e.g., advertising) stress the value of "attention-getting devices", and attention is considered one of the key steps in the communication process according to heuristic treatments (e.g., Schramm, 1954: 13). The measurement of attention has, understandably then, occupied a good deal of thought and effort on the part of mass communication researchers. The empirical measures that have resulted have had considerable impact on behavioral theorization about mass communication effects.

This paper will be concerned with both methodological and theoretical issues associated with the measurement of attention, with specific reference to news and public affairs content in the mass media. After a brief review of other methods of assessing attention in media research, we will examine in detail a wide array of survey measures in a panel study of adolescents and their parents. Methodological issues addressed here will include the empirical utility of several different ways of asking survey questions about attention. Theoretical issues revolve around comparisons between

newspapers and television, and particularly the suspicion that neglect of attention has led to an underestimation of the importance of television news as a contributor to the public's political knowledge.

Approaches to Measurement

Because attention is a covert mental activity occurring within the "black box" of the person, its measurement poses a major challenge to methodological inventiveness. Three general approaches are to be found in the research literature: inferences based on observed behaviors, psychophysiological techniques, and self-reports. Each method has its special research uses, and its limitations.

Behavioral observation. The "behavior" of attending to mass media can easily escape the view of an external observer entirely, unless very thorough procedures are established. Some notable attempts have been made to infer attentional states by observation of individuals' overt actions while they are using media, such as filming movements of family members while a TV set is on (Bechtel, Achelpohl and Akers, 1971). There have been elaborate methods for the careful coding of facial expressions (Ekman, Liebert, Friesen, Harrison, Zlatchin, Malmstrom and Baron, 1971) and children's eye gaze or aversion (Krull and Husson, 1979; Alwitt, Anderson, Lorch and Levin, 1980) during experimental presentations of film and videotape stimuli. These behavioral observations establish that there is considerable variation, from person to person and from one media presentation to another, in attention. An emerging point of major theoretical importance has been that attention to television, viewed in a "natural setting", can be quite low or even non-existent; one cannot sensibly equate simple operational measures of exposure to a TV stimulus with a presumption that its effects can be tested in the same way as with

more closely attended media forms.

Observational methods do not, unfortunately, lend themselves to comparisons across media; they are particularly inapplicable to the often-sought contrast between audio-visual and print media. Moreover, they are cumbersome and impractical for most research purposes; of problematic validity in that an external observer is in a poor position to determine when another person is mentally attentive; and of low specificity in that it is hard to identify which aspect of the media presentation is being given attention.

Psychophysiological measurement. Physiological measurement offers an alternative approach (Reeves, Thorson and Schleuder, 1985). It is if anything more cumbersome than external observation, but more sensitive to fine-grained fluctuations in internal activity. Instrumentation to sense arousal of the autonomic system has been employed widely albeit not frequently in mass communication research. Indicators of generalized arousal, borrowed from long traditions of laboratory research in experimental psychology and psychophysiology, have included reaction time (Britton and Tesser, 1982; Thorson, Reeves and Schleuder, 1985), blood pressure and galvanic skin response (Zillmann, 1982).

Brain wave activity represents the current threshhold of physiological measurement. Reeves, Thorson and their associates have charted individuals' reactions to laboratory presentation of television advertisements, by tracing cortical activity registered on an electroencephalogram (Reeves, Thorson, Rothschild, McDonald, Hirsch and Goldstein, 1984) and the emission of alpha waves (Reeves et al., 1985). The gain in both reliability and specificity of measurement

over observational methods is considerable in physiological methods, particularly those involving indicators of activity emanating directly from the brain. (Most theorists of mental activity consider the brain to be the locus of attention.)

These programs of research hold considerable promise for extending our understanding of attentional micro-processes. They do not, however, provide an immediate solution to multivariate field research problems in which attention is one variable among several to be measured, or in which attention to different media is to be assessed comparatively. The well equipped laboratory is ideal for monitoring reactions to highly specific stimuli, but instrumentation has a long way to develop before it will be suitable for incorporation into field data collection on long-term cumulative effects of mass communication.

Self-report. Introspective self-observation by the individual is a time-honored but also much denigrated way of measuring media attention. The interview procedure, in which a person is asked to recall prior mental states, is used not because it is the ideal method, but because for many research purposes it is the only measure available. Webb and Salancik (1968) liken it to playing a crooked roulette game when it is "the only wheel in town." In experimental effects research, correlations with self-reported attention measures are often used as a validity check (e.g., Krull and Husson, 1979; Reeves et al., 1985).

But the more common use of self-reported self-observation is of course in survey research. The central purpose of this paper is to evaluate a number of approaches to survey measurement of attention to mass communication, toward the general goal of improving this admittedly imperfect method. We will concentrate our own attention

upon news and public affairs channels -- principally television and the newspaper, two media whose effects are often contrasted by students of mass communication.

Attention vs. Exposure

Exposure, not attention, to news media has traditionally been the focus of survey research related to public affairs. Respondents are often asked, for example, how many hours they spend per day watching television; this single item -- unqualified by any evidence of attention level -- is used as the independent variable to predict a wide range of presumed effects of TV (e.g., Gerbner, Gross, Morgan and Signorielli, 1980; 1984). In cross-sectional research this simple measure is often correlated with other factors, but these associations can disappear with a few simple demographic controls (Hirsch, 1981).

In the national election studies by the Center for Political Studies (CPS) of the University of Michigan, respondents are usually asked how many programs or stories about the election they have watched, heard, or read; one questionnaire item is allocated per medium. An exception to this procedure was the 1979 CPS pilot study. In addition to measures of exposure (whether R reads a daily newspaper; number of newspapers R reads; how often R watches early evening national news, and late evening local news), the CPS instrument included two measures concerning "attention to national news and what the government does", both "when you read the newspapers" and "when you watch the news on TV." Chaffee and Choe (1979) found a clear difference between the two media as predictors of knowledge about the candidates running for President in 1980 and their issue positions. Across six different sample-and-measure

combinations, exposure measures accounted for most of the effects of newspapers but attention measures accounted for most of the effects of television news. Specifically, whether one reads a daily newspaper explained a median (across sub-analyses) of 6.3% of the variance, and the number of newspapers read explained an additional 6.4%; the newspaper attention measure added only 3.9% (median R^2). By contrast, the two television news exposure measures accounted for only 0.7% of the variance in candidate knowledge, but an additional 8.9% was explained when the TV attention item was added to the equation (Chaffee and Choe, 1979: Table 3).

In a survey of knowledge of economic news, McLeod and McDonald (1985) found negative correlations with time spent with and reliance upon television, a null relationship with viewing TV public affairs, but a positive correlation between economic knowledge and attention to TV public affairs. With education and age controlled, the increment to R^2 for attention (newspapers and television news) was larger than those for exposure, reliance, and content measures (Table 2).

The anomalous role of television news. These empirical comparisons of the two media in terms of exposure vs. attention measures helps to explain the curious position of television in the empirical research literature on news media effects. Media comparisons based upon exposure measures would seemingly lead to the interpretation that television news contributes little or nothing to the public's knowledge of public affairs. Cross-sectional studies, which analyze correlations between reliance on TV news and indices of associated knowledge levels, tend to yield null (Quarles, 1979) and often negative correlations (e.g., Becker and Whitney, 1980; Patterson

and McClure, 1976). This negative relationship between cross-sectional measures of television viewing and political cognitions extends to the lack of political party identification (Gerbner et al., 1984) and of knowledge underlying "agenda setting" effects (Benton and Frazier, 1976). Findings like these have led such critics as Robinson (1976) to suggest that television is the root of "malaise" in modern political life.

Panel studies, which remove individual differences including background factors (e.g., I.Q., SES) and which account for increases in knowledge rather than absolute levels, can lead to a different conclusion. Both newspaper and television news were found to account for significant increases in knowledge in a longitudinal study of adolescents during the 1968 election year (Chaffee, Ward and Tipton, 1970). That study used a number of items to measure consumption of news via each medium, but did not distinguish clearly between exposure and attention.

It would seem ludicrous on its face to conclude that television news makes no contribution to public affairs knowledge, and that it might even have a detrimental effect. Television news production is not only highly professionalized, it is the focus of intense scrutiny and criticism by political activists. It has been considered the source of most news for most U.S. adults for some years. Experiments clearly show learning from TV news programs (Drew and Reeves, 1980; Lemert, Elliott, Nestvold and Rarick, 1983), and field experiments demonstrate other cognitive effects such as agenda-setting (Iyengar, Peters and Kinder, 1982). When a program is widely viewed, such as a debate between presidential candidates, large increases in people's knowledge of issue positions are found (Sears and Chaffee, 1979).

The weak informative effects attributed to television in most studies are probably due in part to spurious covariance. But they are also quite likely a result of reliance on exposure measures at the expense of attention. As the Chaffee and Choe (1979) data indicate, using exposure measures alone would suggest that newspapers account for 10 to 20 times as much public affairs knowledge as does television. Attention measures indicate instead that the two media are much nearer parity, although newspaper readers still appear to get somewhat more information overall.

The contrast is far from a clearcut one, of course; only a minority of the news audience uses just one of these media, and those who do are almost all television-exclusive. This means that newspaper consumers also benefit from television news inputs, whereas a fair number within the television audience get their news from that medium alone. While the validity of surveys showing that most people say they get "most" of their news from television is questionable, Chaffee and Choe (1979) did find evidence to support it at least marginally. In the CPS national pilot survey of knowledge about presidential candidates and "the most important problem facing the country today, respondents were asked where they had learned each specific item of information in their open-ended responses. For items about candidates, 18% cited TV and 13% newspapers; 38% cited both these media. For "important problem" information items, 13% cited television as their source, 9% newspapers, and 59% said both media.

The simplest way to interpret these figures is that they represent ceiling effects. Virtually all of the 70% of the sample who read a daily newspaper cited that medium as their source for at least

one item of information on candidates and important problems. Almost as high a percentage of the 75% who watch national TV news at least once a week cited TV as a source. Thus, even the small difference in source-recall for specific pieces of knowledge represents a difference in incidence of use of the two media by this test. Users of news media not only can but also do get information from those media. A pro-TV bias in one set of studies (e.g., self-reported source of "most of your news"), or an anti-TV bias in another set (e.g., media exposure measures as correlates of information-holding), suggests not a substantive difference between media nearly so much as an artifact of differences in research methodology. Improved measurement of attention should expand predictive power beyond that of simple exposure to media, especially regarding television news.

Research questions. The empirical issues to be dealt with in this paper are both methodological and theoretical. The more basic questions have to do with attention as a variable in survey research. The theoretical questions regarding the contribution television news makes to public affairs knowledge comprise a further route of exploration.

Attention, while it is usually discussed as an event within an individual, is of course a relationship between the person and something else. A number of alternatives suggest themselves as candidates for the role of "something else" in that relationship. One is the medium itself; is attention paid specifically to television, to the newspaper, to radio, etc? Or is it to content? If the latter is the focus of attention, is it a generic ongoing category of content (e.g. "news" or "foreign affairs"), or is attention specific to particular news events, such as a party convention, or a presidential

proposal on national defense? Put another way, is attention to news media a stable enduring trait of an individual or does it fluctuate over time according to varying "seasons" in the political news cycle?

These are not mutually exclusive possibilities, of course. Each conception of attention might very well exist to some extent. A testable proposition would be framed in terms of the relative incidence of each. When we rely on self-reports, however, estimates of absolute levels are on inherently shaky ground because there is no standard metric against which to judge the "amount" of something as amorphous as attention. Some sort of external validation, comparing a measure against a criterion variable, is needed. In this study we will use two external criteria for the comparative assessment of different survey measures of attention. One will be the other measures of attention themselves. The other will be measures of knowledge about current public affairs topics, which we will treat as criteria of media effects.

Method

The design of this study builds on that of previous research in several ways. Following the example of Chaffee et al. (1970), it is a panel study in which initial levels of knowledge can be partialed out statistically so that any effects found are specific to the period in which the longitudinal study takes place. As in that study, the focus is on news media rather than media in general, and on a period surrounding a national election (1980). A considerably longer time period is involved in this study, from early 1980 through late 1981 (more than three times as long as the six months of the Chaffee et al. panel). Whereas Chaffee et al. (1970) surveyed panels of adolescents,

this study includes separate panels of both adolescents and their parents. The second major benchmark study we are building upon is the Chaffee and Choe (1979) survey in which attention measures were specifically compared with exposure measures for each of the two major news media. In this study, in addition to those two measures, we have included items regarding attention to general ongoing news categories, campaign events and candidates, and specific episodic news topics.

Survey design. The data used in this report were collected in three waves during 1980 and 1981 as part of a study of political socialization in adolescence. The population was defined as Wisconsin residents aged 10 through 17 (at Wave 1, which was conducted late January through March 1980). Households were sampled by professional interviewers of the Wisconsin Survey Research Laboratory using random digit dialing techniques.

In the first wave approximately 100 adolescents at each age level were interviewed, after which interviews were sought with one parent of each (N=718 parent-adolescent pairs). By the third wave, attrition due to moving, refusals, and missing cases had reduced the total sample for analysis here to N=366 families for which complete (three waves) survey data are available for both the adolescent and the parent. Among other published studies reporting findings from this project are Kennamer and Chaffee (1982), Chaffee and Tims (1982), and Chaffee and Miyo (1983), each of which contains some further details on design and measures.

The first wave of interviews took place prior to the Wisconsin primary election of early April 1980. The second wave was conducted in October 1980, just prior to the general election in which Ronald

Reagan defeated Jimmy Carter for President. The third wave occurred in October and November of 1981, after Reagan had been in office for most of the year. Questionnaire items were standardized as much as possible, so that the same questions were asked of the parents and the adolescents in each wave. Some variation in wording, and some additional items representing changes in current political events modified what was mostly a fixed set of questions and response scales.

Because the sample was randomly drawn, it was spread proportionately across geographic areas of Wisconsin and demographic categories, except for an upward bias in socioeconomic status variables due to attrition. Some 44% of the parents had attended college. Parents ranged in age from 27 to 69, but were mostly in their 40s; 59% were mothers, due to the procedure of randomly sampling households including single-parent homes. Approximately 53% of the adolescents were males.

Although this paper does not focus heavily on the socialization aspect of the overall project, the availability of separate adolescent and parent samples provides some useful points of both comparison and replication. Because each adolescent is matched with a parent, the two samples are of equivalent socioeconomic status (assuming SES is an attribute of the family or household, rather than the individual). We should expect considerable difference between the two generations in every variable we are examining here, in that the parents should be higher than their adolescent children in media exposure and attention, and knowledge about politics. They should also presumably provide more reliable measures, and be more stable in all these behaviors, than the adolescents. But in terms of the relationships between these

behaviors, the case should if anything be reversed. While we expect replication in terms of direction of relationships, which is to say positive correlations in all cases for both samples, the importance of attention might well be greater among the adolescents. This prediction would assume that they would have lower knowledge levels at Wave I, and thus more distance to move as a consequence of the intervening campaign and media presentations, and attention to them.

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(Table 1 about here)
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Attention measures. A total of 26 questions were asked of each respondent regarding attention to media news, unless the person reported zero days of exposure (see below) to the medium. The response scale offered these alternatives for each question: "a lot", "some", "very little" or "none." There were slight variations for certain questions, as shown in Table 1. Of the 26 questions, 15 consisted of five that were asked in Wave I, and then repeated verbatim in Waves II and III. These asked about attention "to what the President is doing" (called National Attention below); "to what the United States government is doing with other countries, such as Russia, China, or the Middle East" (called Foreign Attention below); "to news on TV about national politics and government" (called TV News Attention below); "to articles in the newspaper about national politics and government" (called Newspaper Attention below); and "to news on the radio."

There were six questions asked about current news in Wave II only, and three more in Wave III only. In Wave II, one question dealt with primary elections, one each to the two party conventions, and one each to the campaigns of the three principal candidates for President,

Table 1

Marginal Results of Attention Items for Adolescents and Parents [illegible] N=366

Question	Response	Time 1 Adolescents	Time 1 Parents	Time 2 Adol[illegible]	Time 2 Parents	Time 3 Adol[illegible]	Time 3 Parents
Attention to what president is doing:	a lot	14%	50%	12%	50%	15%	[illegible]
	some	59	45	69	43	69	[illegible]
	very little	27	5	19	6	16	[illegible]
		100%	100%	100%	[illegible]	100%	[illegible]
Attention to foreign affairs:	a lot	36%	58%	31%	50%	25%	[illegible]
	some	40	37	50	43	5[illegible]	[illegible]
	very little	21	4	19	6		[illegible]
		97%	99%	99%	99%		[illegible]
Attention to national news on television:	a lot	8%	33%	8%	30%	5%	27%
	quite a bit	26	28	22	29	18	25
	some	36	27	36	26	40	29
	very little	16	5	10	6	16	8
	none	1	0	2	0	1	1
		87%	93%	78%	91%	80%	90%
	didn't watch	13%	6%	23%	10%	19%	11%
Attention to national news in the newspaper:	a lot	7%	25%	8%	23%	4%	19%
	quite a bit	11	25	11	26	9	22
	some	30	31	30	31	34	35
	very little	22	11	23	13	27	14
	none	7	0	8	2	11	2
		77%	82%	80%	95%	85%	92%
	didn't read	23%	8%	20%	5%	14%	8%
Attention to news on the radio:	a great deal	20%	18%	17%	21%	25%	29%
	quite a bit	17	26	19	24	25	20
	some	28	20	31	25	24	26
	very little	27	30	21	23	21	19
	none	8	6	11	7	4	5
		100%	100%	99%	100%	99%	99%
Attention to what candidates said when they debated:	a lot			13%	27%	20%	48%
	some			23	14	40	22
	very little			9	3	12	6
	none			1	1	2	1
				46%	44%	74%	77%
	didn't watch			52%	56%	26%	22%
Attention to primary election:	a lot			13%	30%		
	some			39	45		
	very little			38	23		
	none			10	2		
				100	100		
Attention to Republican Convention:	a lot			15%	22%		
	some			38	37		
	very little			28	26		
	none			19	15		
				100	100		
Attention to Democratic Convention:	a lot			10%	21%		
	some			36	37		
	very little			34	26		
	none			20	15		
				100%	99%		
Attention to what Reagan has said in campaign:	a lot			22%	33%		
	some			44	46		
	very little			26	18		
	none			8	2		
				100%	99%		
Attention to what Carter has said in campaign:	a lot			19%	35%		
	some			46	44		
	very little			25	18		
	none			10	3		
				100%	100%		
Attention to what Anderson has said in campaign:	a lot			10%	21%		
	some			35	38		
	very little			35	32		
	none			20	9		
				100%	100%		
Attention to what the president says about cutting budget:	a lot					23%	57%
	some					54	36
	very little					21	6
	none					1	1
						99%	100%
Attention to what the president says about tax cuts:	a lot					26%	50%
	some					46	37
	very little					26	10
	none					2	1
						100%	98%
Attention to what the president says about national defense:	a lot					42%	50%
	some					36	39
	very little					21	10
	none					1	1

Jimmy Carter, Ronald Reagan and John Anderson. (Example: "How much attention have you paid to what Jimmy Carter has said in his campaign?") The three items that appeared in Wave III only referred to activities of the newly installed Reagan administration: "How much attention have you been paying to what the President has been saying about cutting the budget of the national government?"; ". . . about cutting taxes?"; and ". . . about national defense?"

Marginal percentages for each of these items are shown in Table 1. As a preliminary step the intercorrelations among these items were calculated (using pairwise deletion of missing data cases) and factor analyzed (varimax rotation). Two sets of items, a total of 5 of the 26 measures, were dropped from the analysis at this point. Three of these were the questions asked in each wave about radio news attention; these were of low reliability and did not load with other attention measures in either the parent or the adolescent sample. This was also the case with the items referring to the candidate debates; fewer than half the sample had watched any debates by the Wave II interview, and by Wave III (about a year later) the debates were apparently such a distant memory that these measures were of little empirical value.

Each of the five items that were repeated in all three waves showed extremely high stability, when this element was separated from reliability estimates using the test-retest procedures of Heise (1969) and Wiley and Wiley (1970). Given stabilities over time that ranged well above .90 in almost every instance, and rather low single-item reliability coefficients (mostly around .60), we elected to maximize reliability by summing responses to these items across the three

waves. This provided four three-item indices: National Attention, Foreign Attention, TV News Attention, and Newspaper Attention. Interitem reliability estimates (alpha), as shown in Table 2, ranged from .51 to .74, with a median of .64 (Cronbach, 1951). The lowest of these was the National Attention index, which consisted of the items regarding attention to "what the President is doing." This question obviously did not refer to the same events; during Wave I the President (Carter) was governing, during Wave II he was running vainly for re-election, and during Wave III the President was the newly triumphant Reagan. The interitem "unreliability" probably, then, reflects different item content and not just random error.

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(Table 2 about here)
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Three indices of specific attention within interview waves were also constructed. These included Convention Attention (2 items) and Candidate Attention (3 items) in Wave II, and Reagan Programs Attention (3 items) in Wave III. Table 2 shows descriptive statistics for each; the specific items and their marginal percentages are given in Table 1. Interitem reliability coefficients (alpha) ranged from 0.83 to 0.60. The lowest of these values represents attention to the three candidates (Carter, Reagan and Anderson) by the adolescents. There may, again, be more than the usual item-specific variance reducing reliability for this index, in that some adolescents might very well have paid considerably more attention to one candidate rather than another, whereas their parents appear to have responded to the questions more in terms of attention to the three candidates as a set.

Table 2

Descriptive Statistics: Exposure, Attention and Knowledge Measures

Index name	Sample	Mean	(s.d.)	Range	Alpha	(N)
Newspaper exposure	parent	16.3	(6.3)	0-21	.80	(366)
	adol.	10.8	(6.8)	0-21	.77	(366)
TV news exposure	parent	13.8	(5.9)	0-21	.77	(366)
	adol.	8.9	(5.0)	0-21	.65	(366)
Newspaper attention	parent	4.9	(2.5)	0-9	.72	(317)*
	adol.	2.9	(2.3)	0-11	.74	(236)*
National attention	parent	7.4	(1.5)	3-15	.62	(366)
	adol.	5.8	(1.4)	3-13	.51	(366)
Foreign attention	parent	7.3	(1.5)	3-9	.67	(366)
	adol.	6.3	(1.7)	2-9	.54	(366)
Convention attention	parent	5.3	(2.2)	0-9	.71	(366)
	adol.	4.3	(2.1)	0-9	.65	(366)
Candidate attention	parent	5.9	(2.1)	0-9	.83	(366)
	adol.	4.9	(2.0)	0-9	.60	(366)
Reagan programs attention	parent	7.2	(1.8)	0-9	.76	(366)
	adol.	6.2	(1.8)	0-9	.67	(366)
Party symbol knowledge Wave I	parent	9.6	(3.3)	0-14	.81	(366)
	adol.	5.6	(3.1)	0-14	.72	(366)
Party symbol knowledge Wave III	parent	10.2	(3.1)	0-14	.81	(366)
	adol.	6.9	(3.3)	0-14	.74	(366)
Candidate party knowledge Wave I	parent	4.1	(1.2)	0-5	.66	(366)
	adol.	2.4	(1.8)	0-5	.76	(366)
Candidate Party knowledge Wave III	parent	4.3	(1.1)	0-5	.75	(366)
	adol.	3.3	(1.4)	0-5	.70	(366)
Unique candidate knowledge Wave I	parent	2.1	(1.0)	0-3	.58	(366)
	adol.	1.3	(1.0)	0-3	.53	(366)
Unique candidate knowledge Wave III	parent	1.8	(.8)	0-3	.41	(366)
	adol.	1.2	(.9)	0-3	.28	(366)
Party-Issue knowledge Wave I	parent	1.5	(1.0)	0-3	.35	(366)
	adol.	1.2	(1.0)	0-3	.40	(366)
Party-Issue knowledge Wave III	parent	2.8	(1.2)	0-4	.53	(366)
	adol.	2.5	(1.2)	0-4	.51	(366)

* Asked only of those who read a newspaper at least once in last week.

Exposure measures. In each of the three waves, each respondent was asked, "How many days in the last week did you read a newspaper?" and "How many days in the last week did you watch the news on television?" Each of these items was highly stable across the three waves, and was summed to produce an across-wave index. Table 2 shows descriptive statistics. Interestingly, the means for Newspaper Exposure are higher than for TV News Exposure, when the questions are phrased in these specific terms of days of usage. This contrasts with the more usual report in terms of percentages of people who report using each medium -- where television news exposure would seem to outstrip that of newspapers. (These measures are not really comparable, although they literally use identical phrasing. A "day" worth of newspaper use is not equivalent to a "day" of TV use; no metric for equating use of different media exists, nor is one likely to be devised.) Interitem reliability coefficients (alpha) ranged from .65 to .80 for these two indices.

Knowledge measures. Four criterion measure or dependent variable indices were created for use in assessing the contribution to knowledge of our various attention measures. Separate knowledge measures for Wave I and Wave III were created, so that change in the panel could be traced. Three of these were identical measures asked in all three waves of the survey: knowledge of party symbols, knowledge of the party affiliations of major candidates, and knowledge of the issue positions of the two major parties. (See Kennamer and Chaffee, 1982, and Chaffee and Tims, 1982, for other correlates of these indices.) The fourth index measured party affiliations of candidates who were listed only in the Wave I or the Wave III questionnaire. This last measure will be called Unique Candidate

Knowledge, to distinguish it from the repeated measure of Candidate Party Knowledge. The other two indices are called Party Symbol Knowledge and Party-Issue Knowledge. In the regression analyses below the wave number will be appended to the knowledge measure name, so that for example the Wave III index of party symbol knowledge is called Party Symbol Knowledge III. For details of knowledge indices, see Appendix A.

Hypotheses and Plan for Analysis

Our data analysis will proceed in two phases. The first and more important consists of a series of regression analyses in which the various attention indices are assessed for their power to predict gains in knowledge beyond the more conventional media exposure measures. The second, more exploratory, analysis will focus on the time-specific attention indices. The general purpose is to look for evidence that particular episodic news events can arouse attention that is appreciably different from the person's base level -- which as we have already noted is quite stable.

A number of hypothetical expectations have already been suggested. The most central proposition at stake here is that attention measures should account for gains in knowledge beyond what can be attributed to exposure alone. A second key hypothesis concerns the comparison of television vs. newspapers. We expect attention measures to reduce the apparent lead of the newspaper over television as a correlate of public affairs knowledge. This may, however, be taken care of to a considerable extent by the panel design, which allows us to remove spurious associations that are due to correlated individual differences (as in Chaffee et al., 1970). If this is the

case, we should find in Wave I stronger newspaper-knowledge correlations than TV-knowledge correlations for exposure measures, but the reverse for attention measures. It is much harder to predict, however, what we should expect to find in regression analyses over time, when these variables are controlled and we are accounting for change from Wave I to Wave III rather than cross-sectional variation. Suffice to say at this point that we expect the attention measures to help to redeem the tarnished reputation of television news.

Other hypotheses are not hard to generate, although not necessarily central to our purposes here except as their confirmation will lend a loose sense of validity to the entire analysis. Because there are some near-ceiling conditions among the parents at Wave I, and because we expect them to be much more stable in both their communication habits and knowledge about politics, we should find stronger effects on the adolescents for all communication measures. The same should be true for the more difficult knowledge indices, which is to say the Party-Issue Knowledge measure -- with which even the parents had considerable difficulty (due perhaps to the confusion of positions among the many competing candidates) at Wave I. By Wave III the new Reagan administration had made the policy differences between the parties clear again.

More central to our concerns in this paper are some empirical comparisons that address questions more than they do hypotheses. We are interested in the utility, for future survey research, of the different approaches to asking attention questions. We will look carefully, then, at the tradeoffs between the media attention and the general attention items, by running separate regression analyses in

which the one set of indices replaces the other. We are further interested in the more specific attention measures. Do they add to the predictive power of the survey, beyond the general and media attention indices? And what do their specific correlates suggest about their validity? The latter question will be addressed to some extent in our primary (regression) analyses, and then further explored in a special analysis that focuses on time-specific data.

Results

Correlations among the major indices are shown in Table 3, with data for parents above the diagonal and for adolescents below. With one non-significant exception, all are positive, and the great majority are significantly greater than zero. The exceptions involve the difficult Wave I Party-issue Knowledge index or -- important to note -- television news exposure. Perhaps the most significant for its non-significance is the very low correlation (r=.08) between the newspaper and television exposure indices. The corresponding correlation similarly rather low (r=.19) in the parent sample. By contrast, the newspaper-TV attention correlations (r=.67 for parents, r=.45 for adolescents) are among the highest entries in the table. This suggests that the strong individual differences in use of these specific media do not carry over to the person's attention to news within a medium. Indeed, all of the attention indices are positively intercorrelated, although not so highly that they would seem to be measuring the same general, stable behavior. The median inter-attention correlation is r=.40 among the adolescents and r=.47 for their parents.

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(Table 3 about here)

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The media exposure measures are, as we expected on the basis of many prior studies, quite differentially correlated with knowledge. Among the parents newspaper exposure is correlated more strongly than is television exposure, with every knowledge measure; this difference is particularly marked at Wave I. Again with the exception of the difficult Party-issue Knowledge index, the same pattern holds for the adolescents. It is not especially strong, however; even the newspaper exposure-knowledge correlations are quite weak among the adolescents, especially at Wave III. The media attention measures correlate more strongly overall with knowledge than do the exposure indices, and do not produce the newspaper-television difference of exposure. This statistical comparison is not quite appropriate, however, since attention is contingent upon exposure; that is, the attention-knowledge correlations represent only those who were exposed to newspapers or television, respectively, in the past week. In our regression analyses we will take out all variance attributable to exposure before examining the effects of attention on knowledge.

Hierarchical regression. The main analyses of this paper (Tables 4-7) present results of a series of hiearchical regression procedures. Each of these involves the successive computation of four equations. The first equation in each case consists of the autocorrelation of the dependent variable (Wave III knowledge index) with itself over time (i.e. Wave I knowledge is the independent variable). Exposure measures are added in the second equation; the effects of exposure are estimated by subtracting the variance

Table 3

Zero-order Correlations Between Indexes[1]

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
TV Exposure (1)	---	.19	.44	.40	.51	.31	.37	.31	.29	.12	.15	.11	.02*	.12	.22	.07*	.12
Newspaper Exposure (2)	.08*	---	.32	.25	.27	.46	.21	.14	.22	.38	.37	.36	.21	.34	.28	.22	.27
National News Attention (3)	.41	.20	---	.70	.65	.60	.42	.47	.54	.33	.36	.37	.17	.32	.32	.25	.25
Foreign Affairs Attention (4)	.34	.21	.52	---	.63	.57	.33	.38	.56	.29	.33	.31	.11	.27	.28	.25	.20
TV Attention (5)	.44	.22	.57	.54	---	.67	.38	.41	.50	.37	.37	.41	.14	.36	.35	.23	.27
Newspaper Attention (6)	.19	.40	.41	.36	.45	---	.30	.37	.50	.30	.34	.34	.17	.29	.28	.24	.21
Convention Attention (7)	.37	.12	.41	.33	.36	.27	---	.47	.35	.20	.26	.29	.12	.21	.30	.29	.16
Candidate Attention (8)	.22	.24	.41	.35	.40	.46	.42	---	.38	.18	.28	.23	.13	.21	.23	.25	.16
Reagan's Programs Attention (9)	.30	.14	.40	.45	.38	.24	.32	.25	---	.26	.27	.22	.21	.20	.26	.22	.14
Symbol Knowledge 1 (10)	-.01*	.15	.18	.10	.31	.15	.13	.18	.14	---	.69	.61	.37	.80	.57	.43	.47
Same Party Knowledge 1 (11)	.13	.21	.30	.24	.37	.20	.22	.29	.15	.49	---	.65	.31	.61	.67	.45	.46
Unique Party Knowledge 1 (12)	.14	.20	.31	.19	.33	.20	.24	.19	.12	.40	.57	---	.23	.55	.52	.44	.40
Issue Knowledge 1 (13)	.05*	.01*	.06*	-.02*	.07*	.11	.07*	.08*	.05*	.37	.28	.28	---	.34	.30	.16	.43
Symbol Knowledge 3 (14)	.08*	.18	.30	.22	.31	.25	.26	.30	.22	.55	.45	.33	.28	---	.60	.43	.52
Same Party Knowledge 3 (15)	.12	.18	.31	.29	.32	.18	.30	.26	.22	.27	.46	.32	.13	.48	---	.40	.45
Unique Party Knowledge 3 (16)	.13	.16	.20	.22	.29	.21	.27	.28	.16	.30	.44	.29	.11	.39	.47	---	.33
Issue Knowledge 3 (17)	.12	.11	.18	.19	.26	.13	.17	.19	.18	.23	.32	.21	.25	.41	.39	.27	---

[1]The correlation coeficients above the diagonal are for parents; those below the diagonal are for adolescents.

NOTE: N=366 except: TV Attention for parents N=299; Newspaper Attention for parents N=317; TV Attention for adolescents N=221; Newspaper Attention for adolescents N=236.

* $p < .05$, not significant

explained by autocorrelation (Eq. 1) from the total variance (R^2) explained by autocorrelation and exposure combined (Eq. 2). This logic is followed throughout, each increment to R^2 being tested for significance against the residual variance that remained to be explained when the most recent equation was calculated (consult Cohen and Cohen, 1983: 120-22).

Attention effects are tested in three further equations, from which the variance attributable to autocorrelation and exposure is subtracted. We have separately tested the Media Attention (TV news, newspaper) indices and the General Attention (national, foreign) content-oriented measures, in separate hierarchical regressions. In Tables 4-7 these third equations are called Eq. 3a and Eq. 3b, respectively Finally, a fourth equation is run in each analysis, in which the three Specific Attention indices (conventions, candidates, Reagan programs) are added to the independent variables of the third equation.

In all there are 16 hierarchical regression analyses, each consisting of four successive equations, reported in Tables 4-7. Each table shows both the Media Attention and the General Attention analyses, for both the parent and adolescent samples. The four tables represent four different Wave III dependent variables: Party Symbol Knowledge, Candidate Party Knowledge, Unique Candidate Knowledge, and Party-issue Knowledge. Cell entries in these tables consist of two statistics: the beta weights for each independent variable in the equation listed in the left-hand column, and (in parentheses) the R^2 values for each increment, and for the total equation (Eq. 4). Significance tests are given for both statistics. The more directly

interpretable are those associated with the increments to R^2, which indicate whether the independent variables in a given block add significantly to the predictive power of the total equation to that point in the data column. The significance of betas varies depending upon what other variables appear in the same equation; we have included in our tables notes of significant regression coefficients as a rough indicator of comparative strength of specific relationships only.

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(Table 4 about here)

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Party symbol knowledge. The most enduring form of knowledge in our tests is the association of various symbols, leaders, and general political alignments with the two major parties. We did not find much change in this kind of information (see Table 2) among the parents, who after all had many years before 1980 to learn them; consequently we should not be surprised in Table 4 that almost all of the variance in parental Party Symbol Knowledge at Wave III is explained by what they already knew at Wave I (autocorrelation r=.80). The entire set of nine exposure and attention indices adds only about 1% to the explained variance. Even this trivial increment is dubious, in that it occurs in the fourth equation, for which the strongest beta is a negative value for Reagan Programs Attention. It may have been that the newly elected President Reagan, moving to consolidate his victory by broadening his appeal to Democrats, succeeded in blurring the traditional differences between the parties.

More in line with expectations are the findings in Table 4 for the adolescents. They still had a good deal to learn from early 1980

Table 4

Party Symbol Knowledge III, by Exposure and Attention

(hierarchical regression analyses)

	Media Attention		General Attention	
Independent variables	parents	adolescents	parents	adolescents
Equation 1: autocorrelation				
Party symbol knowledge I	.80**	.55**	.80**	.55**
(increment to R^2 Eq. 1)	(.65)**	(.30)**	(.65)**	(.30)**
Equation 2: add exposure				
Television exposure	.02	.08	.02	.08
Newspaper exposure	.04	.09	.04	.09
(increment to R^2 Eq. 2)	(.00)	(.02)**	(.00)	(.02)**
Equation 3a: add media attention				
TV news attention	.08	.09		
Newspaper attention	-.00	.11		
(increment to R^2 Eq. 3a)	(.00)	(.02)**		
Equation 3b: add general attention				
National attention			.04	.17**
Foreign attention			.01	.07
(increment to R^2 Eq. 3b)			(.00)	(.03)**
Equation 4: add specific attention				
Convention attention	.03	.11	.03	.09
Candidate attention	.05	.10	.06	.10*
Reagan programs attention	-.07	.07	-.06	.04
(increment to R^2 Eq. 4)	(.01)*	(.03)**	(.01)**	(.02)**
(Total R^2 Eq. 4)	(.66)**	(.37)**	(.66)**	(.37)**

Note. Cell entries are standardized regression coefficients (beta). In hierarchical regression, successive equations with new independent variables added to the preceding equation are evaluated in terms of variance explained (increment to R-square). Equations 1 and 2 are identical for both the Media Attention and the General Attention analyses. Equation 3a is specific to Media Attention, 3b to General Attention. Equation 4 enters the same independent variables in both analyses, but is different in that it is added to either 3a or 3b so that the incremental and Total R-square values may differ.

* $p < .05$ ** $p < .01$

(Wave I) to late 1981 (Wave III), and the autocorrelation for them is not nearly so strong as for their parents. The two media exposure measures add a significant but not large (2%) increment to R^2, and there appears to be little difference between television and newspaper exposure as predictors in Eq. 2. Each of the remaining equations adds a significant increment to variance that is specifically attributable to attention. The strongest of these is National Attention, which it should be recalled represents the sum across all three interviews of attention "to what the President is doing." If we were to hazard a specific interpretation on the basis of relatively small quantitative differences, it would be that adolescents who pay close attention to the nation's leaders absorb a general image of the symbolic and traditional differences between the political parties. The broader inferences to be drawn from Table 4 are that (a) attention does account for knowledge gain beyond what is attributable to media exposure alone, (b) this holds for both content-oriented and media-oriented attention measures, (c) there is little difference between newspapers and television effects after the autocorrelation representing initial individual differences is removed, and (d) the learning effects of media news are stronger among the adolescents than their parents. Each of these inferences will be supported to an extent, but with some specific variations, as we examine the other three dependent measures in the next three tables.

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(Tables 5 and 6 about here)
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Candidate party knowledge. Tables 5 and 6 can be interpreted together, as each deals with the respondent's ability to name the political party of leading candidates for national office. Table 5

Table 5

Candidate Party Knowledge III, by Exposure and Attention

(hierarchical regression analyses)

Independent variables	Media Attention		General Attention	
	parents	adolescents	parents	adolescents
Equation 1: autocorrelation				
Candidate party knowledge I	.67**	.46**	.67**	.46**
(increment to R^2 Eq. 1)	(.44)**	(.21)**	(.44)**	(.21)**
Equation 2: add exposure				
Television exposure	.12**	.06	.12**	.06
Newspaper exposure	.02	.08	.02	.08
(increment to R^2 Eq. 2)	(.02)**	(.01)**	(.02)**	(.01)**
Equation 3a: add media attention				
TV news attention	.09	.16		
Newspaper attention	-.03	.01		
(increment to R^2 Eq. 3a)	(.00)	(.02)*		
Equation 3b: add general attention				
National attention			.04	.12*
Foreign attention			-.00	.14*
(increment to R^2 Eq. 3b)			(.00)	(.04)**
Equation 4: add specific attention				
Convention attention	.11*	.16*	.11*	.16*
Candidate attention	-.05	.03	-.04	.01
Reagan programs attention	.03	.07	.04	.05
(increment to R^2 Eq. 4)	(.01)	(.03)**	(.01)*	(.02)**
(Total R^2 Eq. 4)	(.47)**	(.27)**	(.47)**	(.28)**

Note. Cell entries are standardized regression coefficients (beta). Entries in parentheses represent variance explained (R-square). For explanation of hierarchical regression see text and note to Table 4.

* $p < .05$ ** $p < .01$

Table 6

Unique Candidate Knowledge III, by Exposure and Attention

(hierarchical regression analyses)

	Media Attention		General Attention	
Independent variables	parents	adolescents	parents	adolescents
Equation 1: autocorrelation				
Unique candidate knowledge I	.44**	.29**	.44**	.29**
(increment to R^2 Eq.1)	(.20)**	(.03)**	(.20)**	(.08)**
Equation 2: add exposure				
Television exposure	.01	.09	.01	.09
Newspaper exposure	.06	.11	.06	.11
(increment to R^2 Eq. 2)	(.00)	(.02)*	(.00)	(.02)*
Equation 3a: add media attention				
TV news attention	.08	.09		
Newspaper attention	-.00	.11		
(increment to R^2 Eq. 3a)	(.01)	(.04)**		
Equation 3b: add general attention				
National attention			-.05	.03
Foreign attention			.05	.13*
(increment to R^2 Eq. 3b)			(.01)*	(.02)**
Equation 4: add specific attention				
Convention attention	.15*	.13	.15*	.14**
Candidate attention	.09	.13	.09	.16**
Reagan programs attention	.07	.02	.04	.08
(increment to R^2 Eq. 4)	(.03)**	(.03)*	(.04)**	(.04)**
(Total R^2 Eq. 4)	(.24)**	(.17)**	(.25)**	(.16)**

Note. Cell entries are standardized regression coefficients (beta). Entries in parentheses represent variance explained (R-square). For explanation of hierarchical regression see text and note to Table 4.

* $p < .05$ ** $p < .01$

concerns the same politicians at Waves I and III; it thus combines both the learning effects attributable to the Wave I interview ("testing", per Campbell's typology of threats to validity) and the continuing prominence of these political figures. We should not be surprised, then, to find considerably higher autocorrelations for both samples in Table 5 than in Table 6, which analyzes knowledge of the party affiliations of different candidates at Wave I and Wave III. The Unique Candidate Wave III list, which included vice presidential candidates and some third-party candidates, tested more obscure and equivocal knowledge (e.g., Was John Anderson still a Republican, or Patrick Lucey a Democrat, after they ran together as a third major ticket in 1980?) than did the Wave I Unique Candidate list; the means (Table 2) were lower for the Unique III than for the Unique I index.

These differences between the two candidate-party association measures are reflected in some differences between Tables 5 and 6. For the parents, media exposure is sufficient to account for most of the variance in knowledge beyond the initial level as far as the continuing major political leaders are concerned (Table 5). But when it comes to the unique candidates exposure alone (Table 6, Eq. 2) contributes virtually nothing; attention, on the other hand, accounts for an increment of 4% to R^2 -- about one-sixth of the total variance in the final equation. (Note, though, that the meaning of "autocorrelation" is not as clear in Table 6 as in other tables, since the candidates listed in the measure are different at Waves I and III.)

Television shows up rather well in Tables 5 and 6, as a source of learning of leader-party associations for the parents. In particular,

attention to the major party conventions -- to which the TV networks devote much more time and staff than seems warranted on a straight "news" basis alone -- is a strong specific predictor of knowledge gains of this type. Exposure to TV news alone is sufficient to produce some learning for the major enduring candidates (Table 5), but convention attention also shows up as a significant predictor in the final equation. When it comes to the more ephemeral candidates (Table 6), attention to the televised convention events clearly stands out as the strongest correlate of knowledge gain. This is particularly impressive when it is recalled that the conventions of 1980 occurred well over a year prior to the Wave III interviews, and indeed took place some months before the Wave II (pre-election) measures that are not being used in this analysis.

Looking at the adolescent analyses in Tables 5 and 6, the importance of attention measures beyond those of exposure alone becomes abundantly clear. The content-oriented measures (General Attention, Convention Attention) are particularly important predictors of candidate-party knowledge gains in Table 5, and in Table 6 the various blocks of attention measures account for more than one-third of the total variance explained in the final equation (Eq. 4). It appears that media-oriented attention is a stronger predictor of the learning of party affiliations of the ephemeral Unique Candidates (Table 6), whereas content-oriented attention measures worked better where the enduring candidates (Table 5) were concerned.

Taken together, the findings for parents and adolescents for candidate-party affiliation in Tables 5 and 6 make a strong presumptive case for the measurement of attention in survey studies of political mass communication. Where there is no "ceiling effect" on

learning -- i.e. for the adolescents, and for parents' knowledge of new polititial figures -- the attention measures account for considerably more variance than do the exposure measures. This is true even if we limit consideration to the media-specific measures, comparing Equations 2 and 3a in Tables 5 and 6. Our test here has been conservative, in that we have entered the more traditional exposure measures first, requiring in effect of the attention indices that they account for variance beyond that which could be tapped by exposure alone.

The Convention Attention measures, which show up particularly well in all Candidate Knowledge analyses despite being relegated to the final equation, merit further consideration. It is not clear whether we should consider these as media-oriented or content-oriented indices. Conventions are available only via media, principally television, of course. Their "content" consists more of a familiarity with the personalities involved and the intricacies of intraparty politics than with public issues, and this may account for their particular importance in relation to knowledge about party affiliations of various candidates.

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(Table 7 about here)
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Party-issue knowledge. Our final set of regressions, shown in Table 7, deals with respondents' knowledge of issue differences between the major parties. There were only three such items in the Wave I index, and four in Wave III, so the autocorrelations do not represent wholly the same indices; they are rather low, leaving considerable room for learning effects. It is not so surprising,

Table 7

Party-Issue Knowledge III, by Exposure and Attention

(hierarchical regression analyses)

	Media Attention		General Attention	
Independent variables	parents	adolescents	parents	adolescents
Equation 1: autocorrelation				
Party-issue knowledge I	.43**	.25**	.43**	.25**
(increment to R^2 Eq. 1)	(.19)**	(.06)**	(.19)**	(.06)**
Equation 2: add exposure				
Television exposure	.08	.10	.08	.10
Newspaper exposure	.18**	.10	.18**	.10
(increment to R^2 Eq. 2)	(.04)**	(.03)**	(.04)**	(.03)**
Equation 3a: add media attention				
TV news attention	.23**	.24**		
Newspaper attention	-.08	-.03		
(increment to R^2 Eq. 3a)	(.03)**	(.04)**		
Equation 3b: add general attention				
National attention			.09	.07
Foreign attention			.05	.13*
(increment to R^2 Eq. 3b)			(.01)**	(.02)**
Equation 4: add specific attention				
Convention attention	.02	.05	.02	.05
Candidate attention	.04	.07	.03	.07
Reagan programs attention	-.08	.08	-.10	.08
(increment to R^2 Eq. 4)	(.00)	(.01)	(.01)	(.02)*
(Total R^2 Eq. 4)	(.26)**	(.14)**	(.25)**	(.13)**

Note. Cell entries are standardized regression coefficients (beta). Entries in parentheses represent variance explained (R-square). For explanation of hierarchical regression see text and note to Table 4.

* $p < .05$ ** $p < .01$

then, that we find rather strong effects of the media variables in Table 7. Both Media Attention and Exposure add sizable components of variance to the earlier equations. Among the adolescents these media measures account for more variance than the autocorrelation does in the final equation, and the two Media Attention indices are approximately the equal, in predictive power, of the two blocks of content-oriented attention indices.

The television vs. newspaper issue is particularly illuminated by Table 7. If the newspaper has an edge over TV news, it exists for the parents and is limited to the exposure measure. (This coincides with previous research on adult samples, in which only exposure was measured and newspaper predominance as a source of information was inferred.) When media attention is added (Equation 3a), it is television that stands out, for the parents as well as the adolescents. Looking back across all our equations (Tables 4-7), it is the association between TV News Attention and Party-issue knowledge that produces the strongest regression coefficients. This is doubly impressive when one considers the relatively low reliability of the Party-issue Knowledge III index (see Table 2). It is also a theoretically important finding, given the centrality of issue differences in post-Vietnam politics (see Nie, Verba and Petrocik, 1976), and is probably the most significant result in our analysis.

Time-specific analyses. By this point it is clear that our measures do not relate closely to episodes in specific time periods nearly so much as they represent a general factor of attention to public affairs news. Still there is some methodological utility in attempting to develop time-specific questions. Three of our indices, those we have called Specific Attention, refer to episodes in the

political cycle that can be attached to particular waves of data collection. These are the measures concerning the party conventions (late summer of 1980, between Waves I and II); the campaigns of the three candidates during the fall of 1980 (Wave II); and the programs and policies initiated by Ronald Reagan during his first year in office (Wave III, and featured in the Reagan campaign at Wave II).

(Table 8 about here)

Our final set of analyses, shown in Table 8, examines the correlations between each of these indices and time-specific items measuring media exposure, media attention, and general attention. The hypotheses are simply validity checks, and have no particular theoretical basis beyond the assumption that measures of attention to events specific to a given time period should correlate more strongly with other measures specific to that time period. We have, despite our methodological distinction between them included both exposure and attention in this analysis; from the point of view of specific attention, both media exposure and general attention are logically implicated, necessary conditions.

Convention Attention should, by this reasoning, be more strongly related to the less specific measures at Waves I and II than at Wave III (which came long after the conventions). In Table 8, this is the case for five of the six correlates in the parent sample, but for only one of the six for the adolescents. (The pro-hypothetical instances are marked with asterisks in Table 8.) If we compare only Waves II and III, the correlations at Wave II are higher for five of six (with the sixth a tie) again for the parents; among the adolescents, the

Table 8

Correlations Between Attention and Exposure Items, and Time-specific Indexes

Items	Time[a]	Parents: Conventions	Parents: Candidates	Parents: Reagan's Programs	Adolescents: Conventions	Adolescents: Candidates	Adolescents: Reagan's Programs
TV Exposure	1	.29	.18	.13	.26	.13	.20
	2	.35 $T_{12} > T_3$*	.28 $T_2 > T_{13}$*	.28 $T_{23} > T_1$*	.32 $T_{12} > T_3$*	.26 $T_2 > T_{13}$*	.20 $T_{23} > T_1$*
	3	.29	.17	.30	.27	.12	.29
Newspaper Exposure	1	.14	.02 (n.s.)	.12	.04 (n.s.)	.17	.10
	2	.22 $T_{12} < T_3$	.07 (n.s.) $T_2 > T_{13}$*	.24 $T_{23} > T_1$*	.15 $T_{12} < T_3$	.24 $T_2 > T_{13}$*	.07 (n.s.) $T_{23} > T_1$*
	3	.20	.08 (n.s.)	.24	.12	.19	.18
TV Attention	1	.39	.23	.42	.16	.28	.16
	2	.31 $T_{12} > T_3$*	.22 $T_2 > T_{13}$*	.37 $T_{23} < T_1$	.36 $T_{12} < T_3$	.35 $T_2 > T_{13}$*	.30 $T_{23} > T_1$*
	3	.24	.18	.43	.38	.30	.39
Newspaper Attention	1	.25	.16	.39	.12	.24	.13
	2	.30 $T_{12} > T_3$*	.18 $T_2 > T_{13}$*	.43 $T_{23} > T_1$*	.26 $T_{12} < T_3$	.36 $T_2 > T_{13}$*	.26 $T_{23} > T_1$*
	3	.20	.10	.40	.24	.34	.18
National News Attention	1	.32	.22	.35	.24	.24	.23
	2	.33 $T_{12} < T_3$	.26 $T_2 > T_{13}$*	.48 $T_{23} > T_1$*	.32 $T_{12} < T_3$	.34 $T_2 > T_{13}$*	.29 $T_{23} > T_1$*
	3	.33	.25	.50	.38	.35	.39
Foreign Affairs Attention	1	.29	.20	.36	.24	.23	.31
	2	.26 $T_{12} > T_3$*	.14 $T_2 < T_{13}$	.46 $T_{23} > T_1$*	.21 $T_{12} < T_3$	.30 $T_2 > T_{13}$*	.33 $T_{23} > T_1$*
	3	.23	.17	.51	.31	.28	.40

[a] 1 = Late February and early March 1980 interviews (prior to party conventions)
2 = Early October 1980 interviews (post party conventions; prior to general election)
3 = November and December 1981 interviews (Ronald Reagan had been in office about one year)

* Predicted pattern was found: For Conventions the mean of Time 1 and Time 2 > Time 3; For Candidates Time 2 > the mean of Times 1 and 3; and for Reagan's Programs the mean of Time 2 and Time 3 > Time 1.

results improve to three of six -- but that, of course, represents only what would be expected on the basis of chance alone.

Candidate Attention is more strongly correlated with the Wave II measures than with the average of the Wave I measures in five of six comparisons for the parents, and all six of six for the adolescents. The same box score occurs for Reagan Programs Attention, when we compare the Wave III correlations to the average for Waves I and II. Aside from the Reagan Programs-General Attention correlations, however, the numbers are not especially impressive for either their magnitude or their conformance to the hypotheses. Across all three Specific Attention indices, the strongest correlation in each set of three time-specific variables is the hypothesized one in 10 of 16 instances (ignoring two ties) for the parents, and 13 of 18 for the adolescents. These figures (68% of all comparisons coincide with the hypothesis) are more than twice the chance expectation of one in three. If we test all possible comparisons (N=108) at once, using the expectations T2>T1>T3 for Convention and Candidate Attention and T3>T2>T1 for Reagan Programs Attention, the hypothesized correlation is greater in 70% of all unequal cases (compared to chance expectations of 50-50). Both of these gross findings are significantly greater than chance by sign test -- but still far from what one might anticipate if people's attention fluctuated greatly with major media or news events.

As is often the case with "exploratory" efforts, we have discovered in Table 8 what might be thought of as a few "islands" of validity in the Specific Attention measures. Whether they represent emergent features of a more structured "archipelago" remains for future research to determine. We doubt, though, that there lies in

this direction of exploration a separate undiscovered "continent" of specific attention that is unattached to the larger whole of media news attention.

Conclusions

The measures we have introduced in this paper are more notable for their utility and general validity than for their reliability or precision. Attention to news media appears to be a consistent individual difference that accounts for substantial variation in learning beyond the effects of simple exposure. There is some evidence of fluctuation in attention from one medium to another, one kind of news to another, and one time to another, but these dimensions of variation are overshadowed by the general trait that we might call attentiveness to news media.

Measurement of this variable in survey research can take several forms that we have examined here. We would not recommend heavy investment of survey questionnaire resources in Specific Attention items. Although in certain instances they proved useful here, unless one's study is focused on a particular news or media event it is unlikely that attention measures specific to current elements of media news will add much to empirical analysis or theoretical development. The major options that merit strongest consideration are measures of (a) general attention to broad enduring categories of news and (b) media-oriented measures that refer to news in general but one source in particular.

There might seem to be little to choose between General Attention and Media Attention on the face of our analyses, which have used these two classes of measures as alternatives (Equations 3a vs. 3b in Tables

4-7). Each added significant variance to the adolescent analysis for every dependent variable; general attention was the stronger predictor for Party Symbol and Candidate Party Knowledge, media attention the stronger for the more difficult Unique Candidate and Party-issue criteria. For the parents, neither was significant for the first two dependent variables; general attention was significant for both of the latter two, but media attention predicted Party-issue knowledge gains more strongly.

The preferable approach will not be indicated mechanistically by sheer numbers, here or elsewhere, but rather is a choice to be made in the context of one's theoretical purpose and study design. Media attention measures are contingent upon media exposure to some extent, and that is both a weakness for some research purposes and a strength for others. If, for example, one anticipates making comparisons between media (e.g., television vs. newspapers), then media attention measures are essential. Exposure items alone clearly understate the case for television's effects, and we would recommend media attention measurement especially strongly for cross-sectional designs in which media use levels will be confounded with individual differences of other kinds. Adding media attention measures to the comparison can at least help to reduce the spurious influence of third variables on tests of cognitive effects. General attention measures, on the other hand, are useful when comparisons between media are not sought; attention measured without reference to particular media can be more comprehensive, and might even substitute for medium-specific items of any nature -- exposure or attention.

Our major substantive issue, beyond the methodological considerations just discussed, has to do with the contribution to

public knowledge made by television news. To a great extent the biases in previous cross-sectional analysis have been obviated here because of our panel design. No strong, consistent pattern favoring the newspaper over TV as a news source appeared in our analyses once the autocorrelations of the knowledge measures were controlled. This supports our assumption that the media effects differences reported in various cross-sectional studies (e.g., Patterson and McClure, 1976; Quarles, 1979; Becker and Whitney, 1980; Gerbner et al., 1984; Benton and Frazier, 1976) are spurious results of correlated individual differences. That is, those who utilize television but not newspapers for news -- a relatively small percentage of the U.S. population, but enough to create significant correlations -- tend to be less educated and in other ways less likely to be knowledgeable about public affairs. This in turn will render them less thoughtful, so to speak, less likely to feel efficacious, or to have strong reasons for their opinions, or hold clearcut political positions, and so forth. But none of that is to say that it is television news that renders them cognitively wanting in this relative sense. Just the opposite appears to be the case: when initial knowledge levels are controlled, television news makes about as strong a contribution to knowledge gain as does the newspaper.

Measurement of attention in addition to simple exposure is valuable, even in panel designs, in that it more adequately reflects the person's utilization of television news. To answer a question about "reading" a newspaper is simultaneously to report on one's exposure and attention (although it provides no guarantee that the reader is being attentive to public affairs news, of course). The

same does not hold for television use, however. One can "watch" a TV news program simply because it is on, without it particularly engaging the mind in any serious sense. Addition of questions about attention grasps more fully the behavior that is of interest in assessment of media effects.

Alwitt, Linda, Daniel Anderson, Elizabeth P. Lorch and Stephen Levin (1980) Preschool children's visual attention to attributes of television. Human Communication Research 7: 52-67.

Bechtel, Robert, Clark Achelpohl and Roger Akers (1971) Correlations between observed behavior and questionnaire responses on television viewing. In Eli Rubinstein, George Comstock and John Murray (eds.), Television and Social Behavior. Vol. IV. Television in Day-to-Day Life: Patterns of Use. Washington, D.C.: U.S. Government Printing Office (National Institute of Mental Health), pp. 274-344.

Becker, Lee, and D. Charles Whitney (1980) Effects of media dependencies: audience assessment of government. Communication Research 7: 95-120.

Benton, Marc, and Jean Frazier (1976) The agenda setting function of the mass media at three levels of "information holding." Communication Research 3: 261-74.

Britton, B.K., and A. Tesser (1982) Effects of prior knowledge on use of cognitive capacity in three complex cognitive tasks. Journal of Verbal Learning and Verbal Behavior 21: 421-36.

Chaffee, Steven H., and Sun Yuel Choe (1979) Communication measurement in the March, 1979 NES pilot study. Presented to the American Political Science Assn., Washington, D.C. Madison: Mass Communications Research Center, University of Wisconsin-Madison.

Chaffee, Steven H., and Yuko Miyo (1983) Selective exposure and the reinforcement hypothesis: an intergenerational panel study of the 1980 presidential campaign. Communication Research 10: 3-36.

Chaffee, Steven H., and Albert Tims (1982) News media use in adolescence: implications for political cognitions. In Michael Burgoon (ed.), Communication Yearbook 6. Beverly Hills: Sage Publications, pp. 287-326.

Chaffee, Steven H., Scott Ward and Leonard Tipton (1970) Mass communication and political socialization. Journalism Quarterly 47: 647-59, 66.

Cohen, Jacob, and Patricia Cohen (1983) Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences. 2nd Ed. Hillsdale, N.J.: Lawrence Erlbaum.

Cronbach, Lee (1951) Coefficient alpha and the internal structure of tests. Psychometrika 16: 297-334.

Drew, Dan, and Byron Reeves (1980) Learning from a television news story. Communication Research 7: 95-120.

Ekman, Paul, Robert Liebert, Wallace Friesen, Randall Harrison, Carl Zlatchin, Edward Malmstrom and Robert Baron (1971) Facial expressions of emotion while watching televised violence as predictors of

subsequent aggression. In George Comstock, Eli Rubinstein and John Murray (eds.), Television and Social Behavior, Vol. V. Television's Effects: Further Explorations. Washington, D.C.: U.S. Government Printing Office (National Institute of Mental Health), pp. 22-58.

Gerbner, George, Larry Gross, Michael Morgan and Nancy Signorielli (1980) The "mainstreaming" of America: violence profile no. 11. Journal of Communication 30 (summer): 10-29.

Gerbner, George, Larry Gross, Michael Morgan and Nancy Signorielli (1984) Political correlates of television viewing. Public Opinion Quarterly 48: 283-300.

Heise, David (1969) Separating reliability and stability in test-retest correlations. American Sociological Review 34: 93-101.

Hirsch, Paul (1981) On not learning from one's own mistakes: a reanlaysis of Gerbner et al.'s findings on cultivation analysis, part II. Communication Research 8: 3-37.

Iyengar,Shanto, Mark Peters and Donald Kinder (1982) Experimental demonstrations of the "not-so-minimal" consequences of television news programs. American Political Science Review 76: 848-58.

Kennamer, J. David, and Steven Chaffee (1982) Communication of political information during early presidential primaries: cognition, affect, and uncertainty. In Michael Burgoon (ed.), Communication Yearbook 5. New Brunswick, N.J.: Transaction Books, pp. 627-50.

Krull, Robert, and William Husson (1979) Children's attention: the case of TV viewing. In Ellen Wartella (ed.), Children Communicating. Beverly Hills: Sage Publications, 83-114.

Lemert, James, William Elliott, Karl Nestvold and Galen Rarick (1983) Effects of viewing a presidential primary debate: an experiment. Communication Research 10: 155-74.

McLeod, Jack, and Daniel McDonald (1985) Beyond simple exposure: media orientations and their impact on political processes. Communication Research 12: 3-34.

Nie, Norman, Sidney Verba and John Petrocik (1979) The Changing American Voter, 2nd. ed. Cambridge, Mass.: Harvard University Press.

Patterson, Thomas, and Robert McClure (1976) The Unseeing Eye: The Myth of Television Power in National Elections. New York: Putnam's.

Quarles, Rebecca (1979) Mass media use and voting behavior: the accuracy of political perceptions among first-time and experienced voters. Communication Research 6: 407-36.

Reeves, Byron, Esther Thorson and Joan Schleuder (1985). Attention to television: Psychological theories and chronometric measures. University of Wisconsin-Madison: Mass Communications Research Center.

Reeves, Byron, Esther Thorson, Michael Rothschild, Daniel McDonald, Judith Hirsch and Robert Goldstein (1984). Attention to television: Intrastimulus effects of movement and scene changes on alpha variation over time. Presented to International Communication Assn., San Francisco. In press, International Journal of Neuroscience.

Robinson, Michael (1976) Public affairs television and the growth of political malaise: the case of "The Selling of the Pentagon." American Political Science Review 70: 409-32.

Schramm, Wilbur (1954) How communication works. In Wilbur Schramm (ed.), Process and Effects of Mass Communication. Urbana: University of Illinois Press, pp. 3-26.

Sears, David, and Steven Chaffee (1979) Uses and effects of the debates: an overview of empirical studies. In Sidney Kraus (ed.), The Great Debates, 1976: Ford vs. Carter. Bloomington: Indiana University Press, pp. 223-61.

Thorson, Esther, Byron Reeves and Joan Schleuder (1985) Effects of channel and message complexity on attention to television. Presented to International Communication Assn., Honolulu. (Revised version in press, Communication Research.)

Webb, Eugene, and Jerry Salancik (1966) The interview, or the only wheel in town. Journalism Monographs No. 2.

Wiley, David, and J.E. Wiley (1970) The estimation of measurement error in panel data. American Sociological Review 35: 112-16.

Zillmann, Dolf (1982) Television viewing and arousal. In Lorraine Bouthilet, David Pearl and Joyce Lazar (eds.), Television and Behavior, Vol. 2. Washington, D.C.: U.S. Department of Health and Social Services, pp. 53-64.

APPENDIX A

Construction of Knowledge Indices

1. Party Symbol Knowledge: one point each was scored for answering the listed party for the following items:

"When I read each of these names or things, which party comes most to your mind . . . the Republicans, or the Democrats? If neither party comes to your mind right away, just say so and we'll go on."

Democrats: donkey, Franklin D. Roosevelt, liberal, labor unions, poor people, Lyndon Johnson, left of center

Republicans: elephant, rich people, right of center, Abraham Lincoln, Richard Nixon, conservative, business

(Note: While some of these party assignments might be arguable, the answers above were the modal ones, and were agreed to more by the parents, and by the adolescents by the time of Wave III.)

2. Candidate Party Knowledge: one point each was scored for correctly identifying the party affiliations of George Bush (R), Jimmy Carter (D), John Connally (R), Ted Kennedy (D) and Ronald Reagan (R).

3. Unique Candidate Knowledge: one point each was scored for correctly identifying the party affiliations of:

Wave I: Howard Baker (R), Jerry Brown (D), Gerald Ford (R)

Wave II: John Anderson (R), Walter Mondale (D), Patrick Lucey (D)

4. Party-issue Knowledge: one point each was scored for answering the party that most respondents named when asked the following questions:

a. "Which of the two main parties do you think is more for cutting down government spending and services, the Republicans or the Democrats?" (answer: Republicans)

b. "Which party wants to do more to protect the environment, the Republicans or the Democrats?" (answer: Democrats)

c. "Which of the parties do you think is more for giving women and minorities special treatment in getting jobs, the Republicans or the Democrats?" (answer: Democrats)

d. "Which of the parties do you think is more in favor of spending more money for the armed forces and defense, the Republicans or the Democrats?" (answer: Republicans) (Note: At Wave I a slight plurality cited the Democrats in response to this question, so it was deleted from the Wave I index. By Wave III a clear majority cited the Republicans.)